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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/840,462	04/24/2001	Yi Li	401184	1939
23548	7590	03/29/2005	EXAMINER	
LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960			SHARON, AYAL I	
		ART UNIT		PAPER NUMBER
		2123		

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/840,462	LI ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Ayal I Sharon	2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 05 January 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 July 2001 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date. _____.   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____.                                   |

## DETAILED ACTION

### ***Introduction***

1. Claims 1-5 of U.S. Application 09/840,462, originally filed on 4/24/2001 are presented for examination. Claim 3 has been amended in the amendment filed 12/16/2004. No claims have been added or cancelled.
2. Examiner has withdrawn the previous art rejections in response to Applicants' arguments filed 12/16/2004. New art rejections have been applied. Therefore, this is a Non-Final Office Action.

### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-5 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of

copending U.S. Application No. 09/840,444. Although the conflicting claims are not identical, they are not patentably distinct from each other because the present application pertains to (e.g., as in claim 1), "thermal characteristics", while the claims in U.S. Application No. 09/840,444 pertain to "biomechanical and structural characteristics". Examiner finds that "thermal" characteristics are a subset of "biomechanical" characteristics.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. More specifically, written description is lacking for "computational simulation of the information", as recited in Claim 1. All dependent claims inherit this defect.
7. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to

enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. More specifically, enablement is lacking for "computational simulation of the information", as recited in Claim 1. All dependent claims inherit this defect.

8. The specification regarding the claimed invention is deficient in the areas cited above. Accordingly, the examiner has made prior art rejections based on the limited scope of information contained in the specification for supporting the claims. The rejections are complete and specifically applied against the claims based on this limited disclosure.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

  - (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
11. The prior art used for these rejections is as follows:

12. Huizenga et al., "An Improved Multinode Model of Human Physiology and Thermal Comfort". Proceedings of IBPSA Building Simulation '99. Sept.13-15, 1999. Vol.1, pp.353-359. (Henceforth referred to as "**Huizenga\_1**").

13. Huizenga, C. "Window Performance for Human Thermal Comfort." 2000 ASHRAE Winter Meeting. Feb. 5-9, 2000. (Henceforth referred to as "**Huizenga\_2**").

14. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

**15. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huizenga\_1 in view of Huizenga\_2.**

16. In regards to Claim 1, Huizenga\_1 teaches the following limitations:

1. A method of creating thermal functional designs of textiles and clothing using computer and visual display monitor controlled by the computer, the method comprising

supplying the computer with information from databases relating to thermal physiological characteristics of a human body

(See Huizenga\_1, especially: First page, "Model Overview" Section)

The "Model Overview" section provides a list of data used in the model.

and thermal characteristics of chosen textile materials  
(See Huizenga\_1, especially: First page, "Model Overview" Section and fourth page, "Clothing Node" section)

One of the data items listed in the "Model Overview" Section is "Clothing (insulation level and moisture permeability)." Also, the "Clothing Node" section teaches that "The addition of a clothing node in the Berkeley model is used to model both heat and moisture capacitance of clothing."

for computational simulation of the information, and  
(See Huizenga\_1, especially: Fifth page, "Implementation" section)

In regards to the following limitation:

creating visual images for the monitor showing modules  
of structural functional designs.

Huizenga\_1 expressly teaches (see Fig.3) an image showing the 16 body segments of the Berkeley model, and also teaches (see Fig.8) a graph showing the temperatures predicted by the Berkeley model for 2 of the 16 body segments (left and right lower arm). Therefore, Huizenga\_1 expressly teaches a visual image for the monitor that shows information pertaining to the structural design of the clothes.

However, Huizenga\_1 does not expressly produce a visual image of the structural design of the clothes per se.

Huizenga\_2, on the other hand, expressly teaches (see Fig.8) producing a visual image of the heat characteristics of segments ("modules") of the body. The structure of the clothes is included in the calculation of this temperature data (see "Introduction"). The temperature data is visually represented by colors of the body segments ("modules").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Huizenga\_1 with those of Huizenga\_2, because it is the same model that is taught in both references (see Huizenga\_2, p.2).

17. In regards to Claim 2, Huizenga\_1 teaches the following limitations:

2. The method according to claim 1, in which the

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database of the human body comprises human model data for specific body functions, including size and shape.  
(See Huizenga\_1, especially: Second page, "Model Overview" and "Segmentation" Sections)

The "Model Overview" section teaches that "... This allows the user to change not only physical data such as height, weight, ..."

Moreover, the "Segmentation" section expressly teaches that:

..... the model segmentation corresponds directly to the UC Berkeley segmented thermal manikin. This device provides us with the ability to accurately measure heat transfer coefficients and clothing insulation values for individual body parts, and we can use this data directly in our comfort model. The manikin measures heat flux to the environment for each segment, providing valuable data for validating the model.

18. In regards to Claim 3:

3. The method according claim 1, in which the database of the textile materials comprises clothing patterns data and product specification data.

(See Huizenga\_1, especially: First page, "Model Overview" Section and fourth page, "Clothing Node" section)

Examiner interprets "clothing patterns data" as corresponding to information as to which body parts are covered by the clothing, and which are not. Huizenga\_1 expressly teaches the use of product specification data, in particular insulation level and moisture permeability. (See First page, "Model Overview" Section and fourth page, "Clothing Node" section).

Moreover, Huizenga\_1 also teaches (see "Introduction") that each body segment is modeled independently, and each segment has its own data pertaining to a clothing layer.

Examiner finds that this data corresponds to the claimed limitation of "clothing patterns data".

19. In regards to Claim 4, Huizenga\_1 teaches the following limitations:

4. The method according claim 1, in which the database of the human body comprises thermal property data, including thermo-physiological and thermal comfort data of the human body.

(See Huizenga\_1, especially: Second page, "Segmentation" Section)

The "Segmentation" section expressly teaches that:

This device provides us with the ability to accurately measure heat transfer coefficients and clothing insulation values for individual body parts, and we can use this data directly in our comfort model. The manikin measures heat flux to the environment for each segment, providing valuable data for validating the model."

20. In regards to Claim 5, Huizenga\_1 teaches the following limitations:

5. The method according to claim 1, in which the database textile materials comprises thermal property data, including fibres, yarns, fabrics and garments.

(See Huizenga\_1, especially: Fourth page, "Clothing Node" section)

The "Clothing Node" section teaches (emphasis added) that:

The moisture model uses the regain approach (Morton and Hearle 1993) to calculate the amount of moisture that a specific fabric will absorb at a given relative humidity.

Examiner finds that fibers and yarns are types of fabrics, and that garments are made out of fabrics. Therefore, these limitations are redundant.

### ***Response to Amendment***

#### ***Re: Information Disclosure Statement***

21. Examiner thanks the Applicants for providing a copy of the Li reference requested by the Examiner in the previous Office Action. The reference has been reviewed and cited in the PTO-892 form accompanying this Office Action.

*Re: Double Patenting*

22. Applicants unpersuasively argue (amendment filed 12/16/2004, p.3, para.4) that "Thermal functional design is very different from biomechanical design." More specifically, the Applicants argue (p.3, para.4) that:

For example, thermal functional design involves computation of human thermo-physiological mechanisms such as heat balance of the body, sweat and temperature regulation, and heat and moisture transfer in clothing and the external environment.

In stark contrast, biomechanical design relates to the computation of the anatomical structure of the human body such as the positions of bones, veins, soft tissues, and skin, as well as the biomechanical properties of clothing materials such as modulus, elasticity and compressability, and mechanical interactions of the body with clothing during wear.

23. Examiner respectfully disagrees with the Applicants. The Huizenga\_1 reference supports Examiner's position that "thermal" characteristics are a subset of "biomechanical" characteristics. The Huizenga\_1 reference (see Abstract) expressly teaches that:

The UC Berkeley Multinode Model is based on the Stolwijk model of human thermal regulation but includes several significant improvements. Our new model includes several significant improvements. Our new model uses sixteen body segments (compared to six in the Stolwijk model) corresponding to the UC Berkeley segmented thermal manikin. Each segment is modeled as four body layers (core, muscle, fat, and skin tissues) and a clothing layer. Physiological mechanisms such as vasodilation, vasoconstriction, sweating, and metabolic heat production are explicitly considered.

Examiner finds that this corresponds to the Applicants' definition of "biomechanical design".

24. In addition, the Huizenga\_1 reference teaches (see Introduction) that:

Applications include evaluating thermal comfort in spaces with asymmetric or transient thermal environments including automobiles, buildings or outdoors.

Examiner finds that Huizenga\_1's "...evaluating thermal comfort ..." corresponds to the Applicants' "thermal functional design."

25. Applicants' arguments have been found to be unpersuasive. Examiner is maintaining the provisional obviousness-type double patenting rejections.

Re: Claim Rejections - 35 USC § 112

26. Applicants unpersuasively argue that the 35 USC § 112 first paragraph rejections of lack of written description and enablement should be withdrawn (see amendment, p.3).

27. More specifically, the Applicants' argue (amendment, p.3, para.1) that the specification teaches that "...computation mathematics using commercially available software packages may be used to match and compute information from thermal databases ...".

28. Examiner notes that at the time the invention was made, there were a variety of mathematical models of "the thermo-physiology of the human body." For example, the Huizenga\_1 reference teaches both a Stolwijk model and a UC Berkeley Multinode Comfort model. Moreover, the Gonzalez article, "Heat Strain Models Applicable for Protective Clothing Systems: Comparison of Core Temperature Response" expressly teaches the following (see p.1017, right column):

Data from collaborative efforts conducted by three separate laboratories were evaluated against two models with separate model formats that employ distinct mathematical approaches but have analogous utility in prediction of heat strain, since they derive their form from fundamentals of heat exchange. This report covers one aspect of the collaboration.

29. Moreover, at the time the invention was made, there was a variety of ways in which a mathematical model could have been implemented in "commercially available software packages". One example was to implement the model in the form of a spreadsheet. Another was to write a small program in a programming language, for example in C++, using a commercially available text editor, compiler, and debugger. Yet another possible implementation was to use a software package oriented to developing simulation models, such as Matlab's Simulink.

30. Examiner finds that this lack of detail in the written description, and consequent lack of enablement, would impose a burden of undue experimentation upon one of ordinary skill in the art attempting to make the claimed invention. Examiner is therefore maintaining the 35 USC § 112 first paragraph rejections.

*Re: Claim Rejections - 35 USC § 102*

31. Applicants persuasively argue (amendment, p.5) that the 35 USC § 102 rejections should be withdrawn. The previous art has been withdrawn, and new art rejections have been applied.

***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached at (571) 272-3716.

Any response to this office action should be faxed to (703) 872-9306, or mailed to:

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2100 Receptionist, whose telephone number is (571) 272-2100.

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March 2, 2005



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